Installation and user manual for FPC100

Single pump controller

FLYGT
a xylem brand

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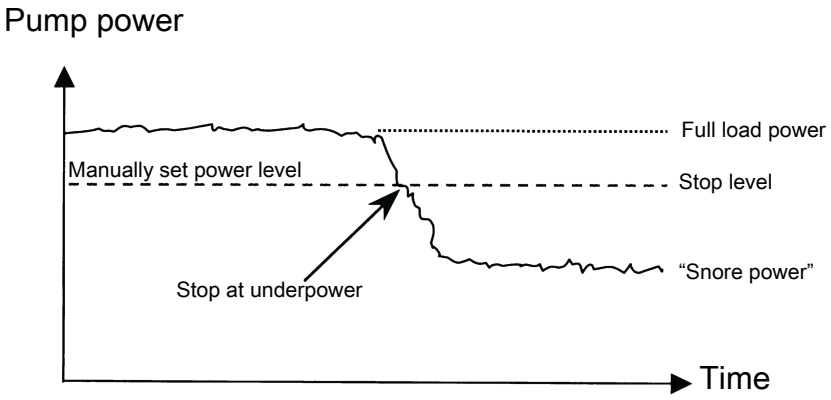
QUICK SET-UP OF FPC100

Quick set-up of FPC100

The purpose with the quick set-up is to initiate the stop function. FPC100 stops the pump when the water level has dropped to such a low level that the pump begins to draw air (snore). At air intake the pump motor power drops and below a manually set power-level FPC100 stops the pump.



If FPC100 has been used previously, some parameters could have been changed and locked. Then go to Complete set-up (page 11) that describes a complete set-up.

The prerequisite for quick set-up is that the pump is installed to a control panel including FPC100. The control panel should preferably also include a Hand-0-Auto switch for the pump.

In event of an alarm during the set-up, see PROTECTION AND ALARM (page 19).

Auto-set at normal pumping (pumping water without drawing air)

1. Check that the amount of water is enough for pumping about 30 seconds without drawing air.
2. Turn on the supply voltage to FPC100 and set the Hand-0-Auto switch in the Auto-position. The pump shall now be pumping water without drawing air. If the pump doesn't start, press START/RESET.
3. When the pump is working steadily, press AUTOSET until "SEt" is shown on the display. The power level for stop is now set.

The stop function is now initiated and FPC100 controls the pump. Adjustments can be made according to DETAILED SETTINGS (page 11).

Auto-set at snoring (pumping a mix of air and water)

1. Set the Hand-0-Auto switch in the 0-position and turn on the supply voltage to FPC100.
2. Step with NEXT to window 13 and press "–" so that the line is shown at the bottom of the display (_). Press ENTER to verify. FPC100 is now prepared for Auto-set at snoring.
3. Set the Hand-0-Auto switch in the Auto-position to start the pump. If necessary, press START/RESET.
4. Run the pump until it starts to snore.
5. Press AUTOSET until "SEt" is shown on the display. The power level for stop is now set, hence stopping the pump due to the snoring.

The stop function is now initiated and FPC100 controls the pump. Adjustments can be made according to DETAILED SETTINGS (page 11).

SAFETY

Safety

WARNING:

Before doing any work, check that the automatic control cubicle is disconnected from the power supply and cannot become live.

Always isolate the power supply before attempting to trace a fault. Otherwise the pump can start without warning.

- Read *TECHNICAL SPECIFICATIONS* (page 22) before starting the installation.
- Authorised electrician shall perform the installation.
- The installation shall comply with general and local regulations.
- Disconnect all supply circuits before installation. Also disconnect all supply circuits before connecting and disconnecting cables to FPC100.

FPC 100 conforms to international standards and is UL/ CSA and CE-marked.

WARNING:

Antes de empezar cualquier trabajo, comprobar que el armario de sistemas automáticos esté desconectado de la red eléctrica, y que no pueda recibir tensión.

Prima di iniziare qualsiasi lavoro, controllare che la centralina degli automatismi sia staccata dalla rete di alimentazione elettrica e che non sia sotto tensione.

Controleer, voordat u begint te werken, of de schakelkast gescheiden is van de elektrische voeding en niet omder spanning kan komen te staan.

Antes de iniciar qualquer trabalho, verifique se o compartimento do sistema automático se encontra desligado da rede eléctrica e assegure-se de que a corrente não poderá ser activada.

Inden nogen form for arbejde påbegyndes, skal det kontrolleres, at automatikskabet er koblet fra elnettet, og at det ikke kan blive spændingsførende.

Før arbeide påbegynnes, påse at automatikkskapet er frakoplet strømnettet og at det ikke kan bli spenningsførende.

Ennen kuin mitään työtä aloitetaan, on varmistettava, että automatiikkakaappi on kytketty irti sähköverkosta eikä voi tulla jännitteiseksi.

Áður en starfræksla hefst, gangið úr skugga um að sjálfvirkur gangsetningarbúnaður sé óvirkur, þ.e.a.s. ekki tengdur við rafmagn.

Ðñéí áðü êÜèå åñãáóßá, åëÝãîòå áí ôï êéâþôéï ôïõ áõôüìáôïõ åëÝã÷ïõ Ý÷åé áðïóõíäåèåß áðü ôï ñåýìá êáé äåí ìðïñåß íá ôåèåß õðü ôÜóç.

UNPACKING, INSPECTION AND RECYCLING

Unpacking, inspection and recycling

The delivery comprises:

- FPC100 control unit
- Current transformer
- Installation and user manual for FPC100

If anything is missing or damaged in the delivery, contact your local Xylem sales office.

Keep the packing. It can be needed for return of the delivery or in case of inspection at damage.

The housing of the FPC100 is made of recyclable plastic, type PC/ABS. The circuit boards contain minimal amounts of tin and lead.

When scrapping the FPC100, all parts must be handled and recycled according to local regulations.

INSTALLATION

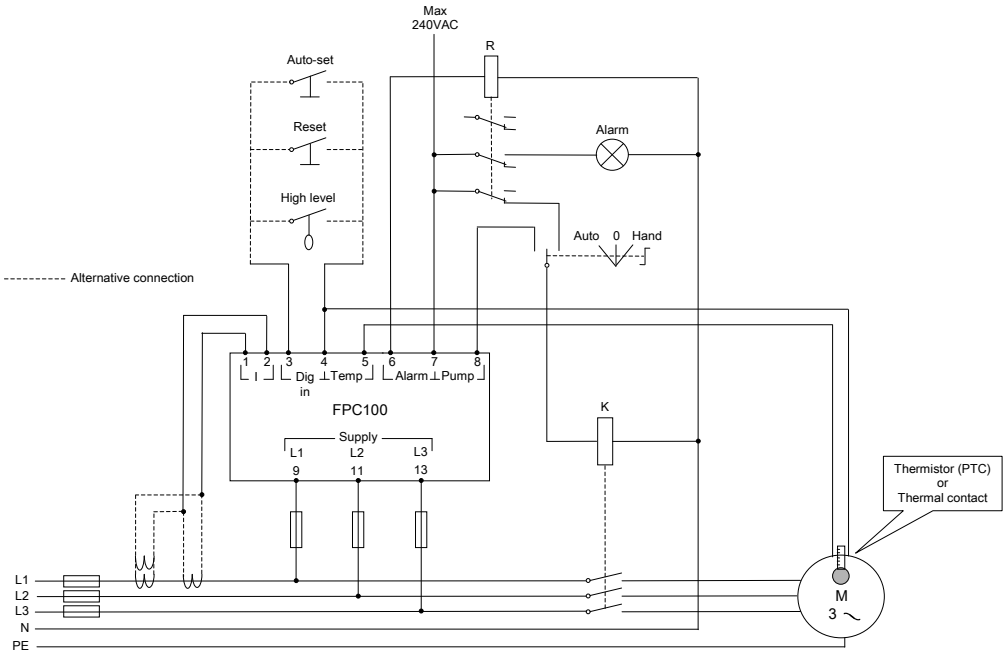
The installation shall be performed by an authorised electrician according to local safety regulations.

WARNING:

Before installing, make sure that no voltage is applied to the equipment.

Check that the rated voltage of FPC100 corresponds with the supplying line voltage. The rated voltage can be found on the rating plate on the side of the control unit.

FPC 100 is mounted on a standard DIN-rail, 35 mm. Dimensions, temperature range and other necessary data for the installation can be found in *TECHNICAL SPECIFICATIONS* (page 22).



Connection terminals

No	Label	Function
1	I	Current transformer input
2	I	Current transformer input
3	DIG IN	Digital input for closing contact
4	DIG IN/TEMP	Signal ground for terminals 3 and 5
5	TEMP	Input for thermistor (PTC), thermal contact and/or any voltage-free opening contact
6	ALARM	Alarm relay output
7	ALARM/PUMP	Common input for alarm- and pump relay

No	Label	Function
8	PUMP	Pump relay output
9	L1	Supply voltage
10	(not used)	
11	L2	Supply voltage
12	(not used)	
13	L3	Supply voltage

Choice and adaptation of current transformer

The pump motor size decides whether one or two current transformers shall be used. For motor currents up to 100 A, one current transformer shall be used. From 100 to 1000 A two transformers are needed.

0-100A

The current through the transformer should be close to its primary current rating, but should not exceed it.

Current transformers with a choice of four ratings are available, i.e. 10A, 25A, 50A and 100A.

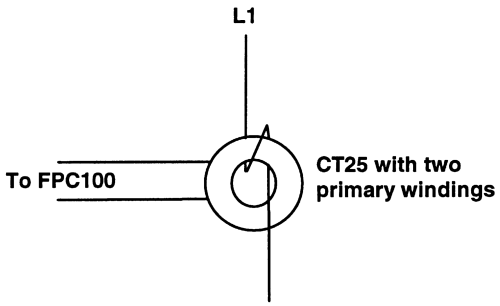
The phase conductor of the motor can be run through the current transformer core an additional number of turns to put the available transformer capacity to full use.

The formula below can be used to determine how many turns the phase conductor of the motor should be run through the transformer core.

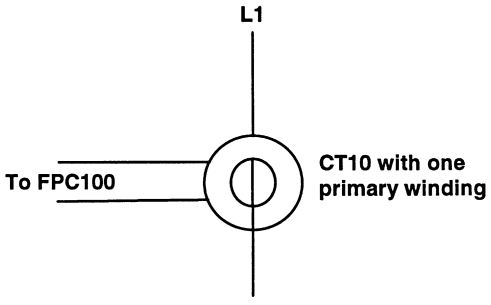
$$\text{Number of turns} = \frac{\text{rated primary current of current transformer}}{\text{rated motor current}}$$

(Round down to next lowest integer value).

Example 1:
Rated current of motor = 12 A
Primary current of current transformer = 25 A
Number of turns = 25 A/12 A
Answer = 2



Example 2:
Rated current of motor = 7.8 A
Primary current of current transformer = 10 A
Number of turns = 10 A/7.8 A
Answer = 1



100-1000A

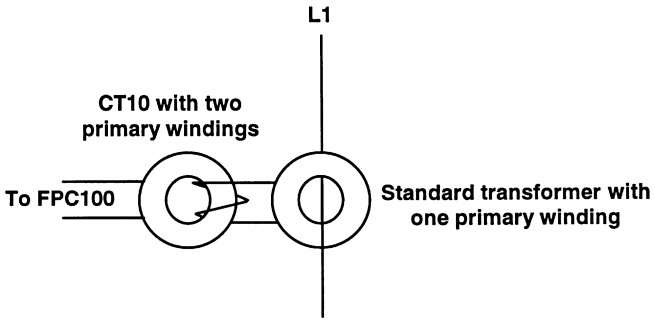
If the rated motor current is in excess of the highest rated primary current of the available transformers (100A), proceed as follows:

1. Use a standard current transformer which has a primary current rating just in excess of the rated motor current and which has a rated secondary current of 5 A.
2. Pass the lead, connecting to the secondary side of the standard current transformer, twice through the 10 A current transformer (CT10).

Example:

Rated current of motor = 210 A

A standard current transformer with a current rating 250:5 A is chosen. The secondary side of the standard transformer should be run twice through the 10 A current transformer core.



Note: The choice and adaptation of current transformer(s) should at pumping with full load power result in a secondary current as close to 55 mA as possible, but should not exceed it. This in order to put the available capacity of the current input range in FPC100 to full use, hence resulting in a better functionality. The secondary current can be checked in window 61 or with an external multimeter.

Current transformer connection

Choose appropriate current transformer (CT) according to *Choice and adaptation of current transformer* (page 6).

Connect the CT secondary winding to terminals 1 and 2.

Note: The CT must be linked to the phase connected to terminal 9 (L1).

Supply voltage connection

Connect FPC100 directly to the pump motor supply cable via terminals 9 (L1), 11 (L2), and 13 (L3). Make this connection before the contactor to the pump motor in order to supply FPC100 also when the contactor is open. See circuit diagram.

When motor fuses larger than 10 A are used, FPC100 must be fused separately.

Alarm relay connection

Terminals 6 and 7 are the alarm relay connections. Terminal 6 is the alarm relay output. Terminal 7 is the common input for the alarm- and pump relays.

When FPC100 is powered off, the alarm relay is “nc” (normally closed). When powered on, “nc” or “no” (normally open) can be selected in window 51. Default setting is “no”.

Pump relay connection

Terminals 7 and 8 are the pump relay connections. Terminal 8 is the pump relay output. Terminal 7 is the common input for the pump- and alarm relays.

When FPC100 is powered off, the pump relay is “nc”. When powered on, “nc” or “no” can be selected in window 52. Default setting is “nc”.

Digital input connection (DIG IN)

Terminals 3 and 4 are intended for an external closing contact. The input is galvanically isolated.

Terminal 4 is the common signal ground for terminal 3 and terminal 5.

The functions for the digital input that can be selected in window 53 are:

1. High level switch (to enable immediate start of the pump)
2. External Reset
3. External Auto-set

Terminal 5 connection (e.g. temperature supervision)

Terminals 4 and 5 can be used for temperature supervision: a thermal contact or a PTC thermistor. As an alternative the terminals can be used with any device using a voltage-free opening contact such as a motor protection unit.

Terminal 4 is the common signal ground for terminal 5 and terminal 3.

FRONT PANEL LAYOUT AND FUNCTION KEYS

Front panel layout and function keys

The operator's panel comprises a display and a set of six keys.

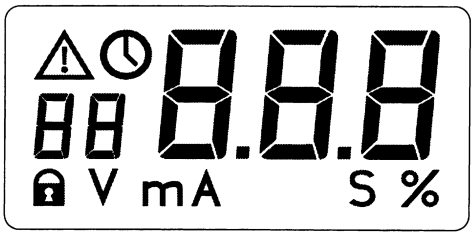
The keys are described below and the display is described in *DISPLAY, SYMBOLS AND UNITS* (page 10).

Key	Function
RESET/START	Resets a latched alarm / Starts pump motor
AUTO SET	Sets the stop level when pressed for 3 s
NEXT	Proceeds to the next window
–	Decreases the displayed value For fast decrement, depress button 6 sec
+	Increases the displayed value For fast increment, depress button 6 sec
ENTER	Confirms the adjustments made

DISPLAY, SYMBOLS AND UNITS

Display, symbols and units

The display contains three symbols, five units, three bigand two small digits.



The small digits show the window number in the menu structure. The big digits show a value. If the value is greater than three digits the two small digits alternate between the window number and the first two digits in the value.

Example: The total pumping time (window 07) is 13467 hours. Window number 07 is displayed for 2 sec and then 13467 is displayed for 2 sec.

Symbol	Meaning
⚠	Alarm
🕒	Time value
🔒	Parameter lock

Unit	Meaning
V	Volt
mA	Milli-ampere
m	Minutes
S	Seconds
%	Percent

Note 1: When FPC100 is turned on, a self test is performed during 3 seconds and all characters and symbols on the display are shown.

Note 2: During alarm the entire display is flashing.

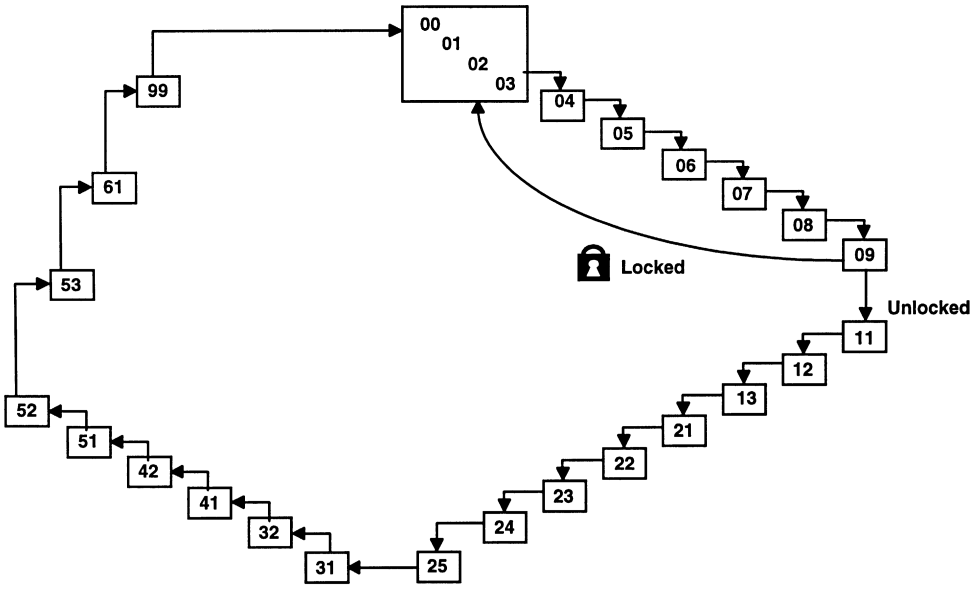
Note 3: If "oor" (out of range) is shown on the display, it means that the value is too big to be shown on the display.

DETAILED SETTINGS

General

Adjustments and settings are done in a single-level menu structure, windows 00-99.

When FPC100 is turned on, press NEXT to proceed to the next window, press + or – to increase or decrease the value and press ENTER to confirm the new value in each window.



One minute after any key has been pressed, FPC100 returns to:

- window 00 if there is an alarm
- window 01 if the pump is pausing
- window 02 if the pump is pumping
- window 03 if the pump is pumping due to start on high level switch

See *Window parameters* (page 15) for a summary of all the menu windows.

Lock and unlock menu settings

It is possible to avoid unintentional change of parameters. Set window 09 to 369 and confirm with ENTER. A padlock is shown, indicating access only to windows 00-09. Re-entering value 369 and confirming with ENTER gives access to all windows.

Returning to default settings

If any value differs from the default settings, "Usr" (set by the user) is displayed in window 99. Press + to return to the default settings. "dEF" (default setting) is then shown in the window. Confirm by pressing ENTER. All user settings are erased and replaced by default settings according to *Window parameters* (page 15). New user settings must be reentered.

Complete set-up

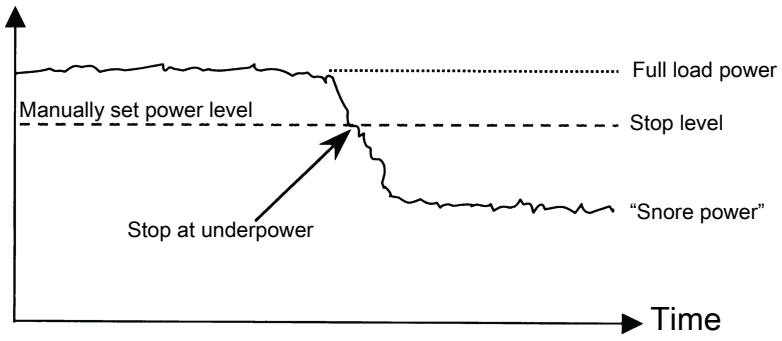
FPC100 stops the pump when the power drops due to snoring. The stop level has to be set manually by the AUTOSET-key. A correct level is in the range between the full load power at normal pumping and the power level at snoring.

The stop level can be set in two ways:

1. Pressing AUTOSET at pumping without snoring sets the stop level as a percentage below the full load power, see *Complete set-up at pumping (without snoring)* (page 12).
2. Pressing AUTOSET at snoring sets the stop level as a percentage above the snore power, see *Complete set-up at snoring* (page 13).

In event of an alarm during the set-up, see PROTECTION AND ALARM (page 19).

Pump power



Complete set-up at pumping (without snoring)

1. Install FPC100 according to *INSTALLATION* (page 5).
2. Set the Hand-0-Auto switch in the 0-position and turn on the supply voltage to FPC100.
3. If a padlock (🔒) is shown on the display, viewing and changing of parameters are locked. Set window 09 to 369 and confirm with ENTER to remove the padlock and get access to parameter settings (windows 11- 99).
4. Clear the present stop level by pressing AUTOSET until "SEt" is shown on the display. The stop level is hence set to 0 % since the pump is off.
5. Set window 13 to (–) and confirm with ENTER. FPC100 is now prepared for Auto-set at pumping without snoring.
6. Set the Hand-0-Auto switch in the Auto-position to start the pump. If necessary, press START/RESET.
7. Make sure that the pump is working steadily. Press AUTOSET until "SEt" is shown on the display.

The stop level (window 11) is now set in relation to the measured power (window 04) and the snore margin (window 12).

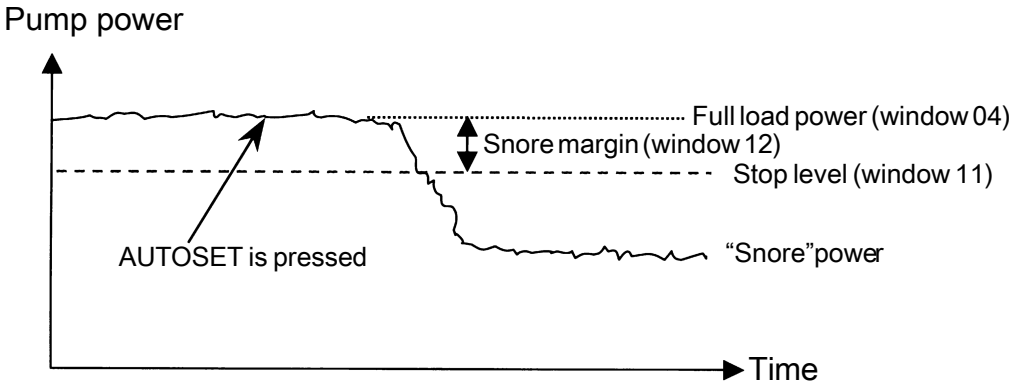
Further adjustments can be done according to *Adjustment of the stop level* (page 14)– *Window parameters* (page 15).

Example:

Stop level (window 11) = Measured full load power (window 04) - Snore margin (window 12)

The pump is pumping water at the measured full load power 68 %. The snore margin is set to 10 %. Pressing AUTOSET will then give the stop level 58 %.

When the pump starts to snore the measured power will decrease from 68 %. When the power has decreased below 58 % FPC100 will stop the pump.



Complete set-up at snoring

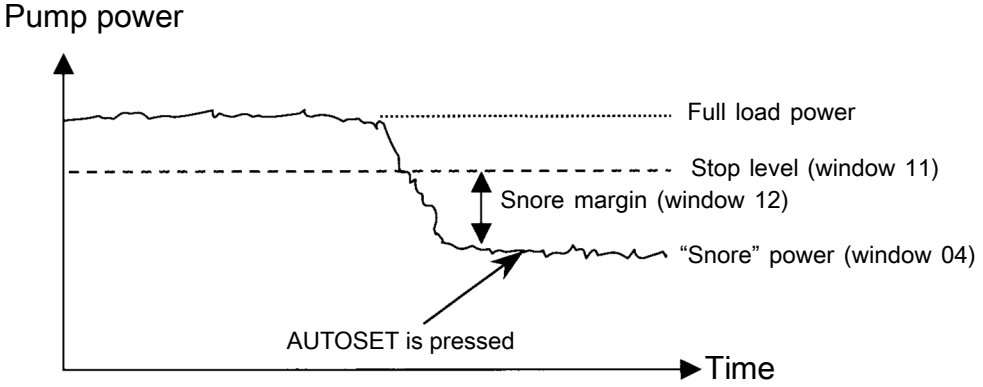
1. Install FPC100 according to *INSTALLATION* (page 5).
2. Set the Hand-0-Auto switch in the 0-position and turn on the supply voltage to FPC100.
3. If a padlock (🔒) is shown on the display, viewing and changing of parameters are locked. Set window 09 to 369 and confirm with ENTER to remove the padlock and get access to parameter settings (windows 11-99).
4. Clear the present stop level by pressing AUTOSET until "SEt" is shown on the display. The stop level is hence set to 0 % since the pump is off.
5. Set window 13 to (_) and confirm with ENTER. FPC100 is now prepared for Auto-set at snoring.
6. Set the Hand-0-Auto switch in the Auto-position to start the pump. If necessary, press START/RESET.
7. Run the pump until it starts to snore.
8. Press AUTOSET until "SEt" is shown on the display. The power-level for stop is now set, hence stopping the pump due to the snoring.

The stop level (window 11) is now set in relation to the measured power (window 04) and the snore margin (window 12).
Further adjustments can be done according to *Adjustment of the stop level* (page 14)– *Window parameters* (page 15).

Example:

Stop level (window 11) = Measured "snore" power (window 04) + Snore margin (window 12)

The pump is pumping a mix of air and water at the measured "snore" power 28 %. The snore margin is set to 20 %. Pressing AUTOSET will then give the stop level 48 %, hence stopping the pump.
From now on FPC100 will stop the pump each pump cycle when the power drops below 48 %.



Adjustment of the stop level

The stop level can always be adjusted in the following two ways:

- Change the snore margin (window 12) and perform a new AUTOSET. The new stop level will be set in relation to the new snore margin. See examples in *Complete set-up* (page 11).
- Change the stop level directly in window 11.

Start conditions and pause time adjustment

In normal operation there are three starting options:

1. Pump start after calculated pause time (window 25 = "on")
2. Pump start after calculated pause time, or at high level (window 25 = "on", window 53 = "1")
3. Pump start at high level only (window 25 = "OFF", window 53 = "1")

Note: Option 2 and 3 require connection of a high level switch according to *Digital input connection (DIG IN)* (page 8).

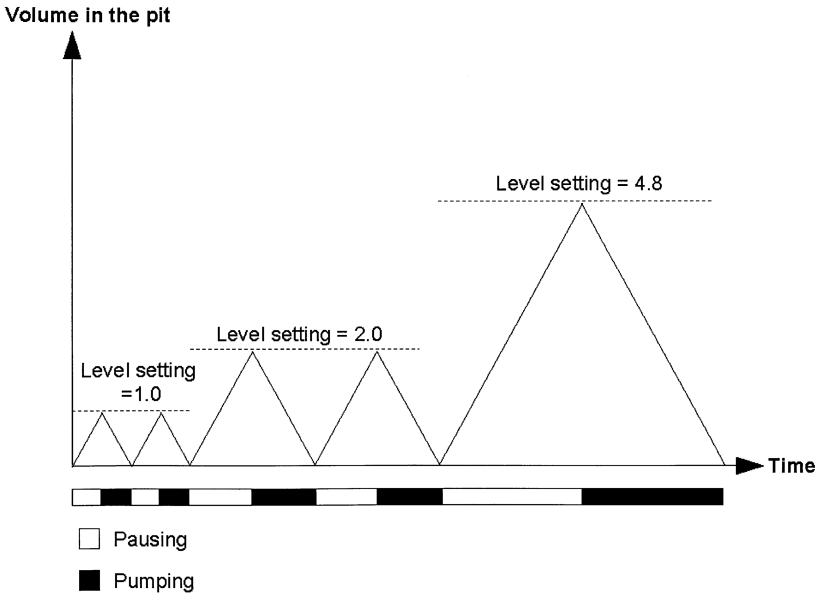
The pump will also start if a non-latched alarm disappears or if the START-button is pressed during pause.

Calculation of pause time is based on previous pumping- and pause times and is controlled by the two parameters **level setting (window 21)** and **maximum pause time (window 22)**. The parameters can be adjusted to achieve the desired sizes of pause times, start level and number of starts per hour.

The **level setting** in **window 21** is set for shorter or longer pumping and pause cycles. Higher value increases the calculated pause time and the amount of accumulated water.

The level setting can preferable be adjusted after some pumping cycles in order to adjust the pause times, and hence the start level in the pit. See schematic pump cycle example below.

Maximum pause time for the pump is set in **window 22.** The calculated pause time will be limited to this value. In some applications the inflow may increase rapidly during a pause. To prevent overflow in these situations the maximum pause time can be set in accordance with the circumstances.



Window parameters

The following table is a summary of all the windows in the single level menu structure. Window number, function and value ranges are listed as well as the default settings that are programmed in FPC100 before delivery.

Window	Function	Value/Range	Default setting	Own settings and comments
00	*Alarm indication.* Flashes when an alarm is present. Symbol ⚠ is flashing	See *PROTECTION AND ALARM* (page 19)		
01	*Remaining time to next calculated pump start.* Standard window during pause. Symbol 🕓 is flashing together with m or S.	720–15 min 900–0 s		
02	*Pumping time since the latest pump start.* Standard window when pumping. Symbol 🕓 is flashing together with m or S.	0–90 s 15–720 min 12–999 h		
03	*Pumping time since the latest pump start due to start on high level.* Standard window when pumping after high level. Symbol 🕓 is flashing together with m or S.	*0–900 s* 15–720 min 12–999 h		
04	*Measured power* in % of the measuring range	0–125 %		
05	*Measured line voltage*	0–999 V		
06	*Measured peak power* in % of the measuring range	0–125 %	0 %	

Window	Function	Value/Range	Default setting	Own settings and comments
07	*Total pumping time* in hours. Symbol ⏲ is displayed. Press + and – simultaneously for 3 sec to set the value to 0.	0–99999	0	
08	*Total number of pump starts.* Press + and – simultaneously for 3 sec to set the value to 0.	0–99999	0	
09	*Parameter lock.* Symbol 🔒 is displayed when parameters are locked. Enter 369 to lock/unlock window 11-99.	0–999	0	
11	*Stop level (power)* in %	0–125 %	0 %	
12	*Snore margin* in %	0–125 %	10 %	
13	*Type of Auto Set.* AUTOSET is pressed at normal pumping when pump doesn't snore (¯). AUTOSET is pressed at snoring or dry running (_)	¯ or _	(¯)	
21	*Level setting* (used for pause time calculation). Higher value increases the calculated pause time. Example: the value 3.2 gives 3.2 times longer pause time than 1.0. The level setting can preferable be adjusted after some pump cycles in order to adjust the pause times, and hence the level in the pit.	1.0–10.0	1.0	

Window	Function	Value/Range	Default setting	Own settings and comments
22	*Maximum pause time.* Symbol ⏲ is displayed. If the calculated pause time is longer than the Maximum pause time, the pump will start after the Maximum pause time.	0–900 s 15–720 min	600 s	
23	*Start-up delay.* Symbol ⏲ is displayed. This is the time from pump start until snore detection is activated.	1–170 s	5 s	
24	*Stop delay.* Symbol ⏲ is displayed. This is the time from snore detection until the pump is stopped.	1–90 s	2 s	
25	*Pump starts when pause time is finished.* "OFF" means start only on high level (set window 53 to 1)	on / OFF	on	
31	*Terminal 5 supervision, e.g. temperature supervision.*	on / OFF	OFF	
32	Terminal 5 alarm latched "on" or not latched "OFF". Can only be used when window 31 is "on".	on / OFF	OFF	
41	Permitted *phase voltage asymmetry level.* Pressing "–" when the window shows 5 % turns off the supervision (OFF).	OFF/5–50 %	10 %	
42	Phase voltage asymmetry alarm latched. Can only be used when window 41 is set between 5-50%.	on / OFF	OFF	

Window	Function	Value/Range	Default setting	Own settings and comments
51	*Alarm relay* (terminal 6) nc = normally closed. no = normally open	nc / no	no	
52	*Pump relay* (terminal 8) nc = normally closed. no = normally open	nc / no	nc	
53	*Digital input* for closing contact. 1 = High level switch (gives immediate start of the pump) 2 = External Reset 3 = External Auto-set	1, 2, 3	1	
61	*Measured current* on terminals 1 and 2.	0–70 mA		
99	*Default settings* (dEF) / User settings (Usr) Setting (dEF) returns to default settings.	dEF / USr	dEF	

PROTECTION AND ALARM

Protection and alarm

When an alarm occurs, the triangular alarm symbol starts to flash. Window 00 becomes active and gives information about the alarm according to the alarm list in the table below.

For all alarms the alarm relay indicates fault. The pump stops for all alarms except F4.

SYMBOL	FUNCTION
F1	Indicates wrong phase sequence between line L1, L2, L3
F2	Indicates bigger phase voltage asymmetry than set in window 41
F3	Indicates that the current from the current transformer is out of range
F4	Indicates that snoring is detected at the same time as the high level switch is activated
F5	Indicates e.g. high temperature in the pump motor
OU	Indicates overvoltage on L1, L2, L3
LU	Indicates undervoltage on L1, L2, L3 or interruption on L1 when FPC100 is switched on

Phase sequence (F1)

When FPC100 is switched on, phases L1, L2 and L3 are checked for correct phase sequence. If wrong sequence is detected, an F1-alarm is generated. The pump will not start.

Note: The phase sequence is checked on the FPC100 terminals. To ensure that the motor will run in the correct direction of rotation, the phases to the motor have to be connected in the same sequence as to the FPC100.

Action:

- Switch off the main supply! Disconnected and swap positions of phases L2 and L3.

Phase asymmetry (F2)

An F2-alarm is generated when the phase asymmetry on the supply voltage exceeds the permitted level during five seconds. The pump will stop.

The permitted level is set in window 41 between 5-50 % or to OFF if supervision not is requested.

In window 42 the F2 alarm can be latched (“on”), or not latched (“OFF”). Reset a latched alarm by pressing RESET.

It can also be reset via the digital input if it is used for External reset.

Action:

- If the alarm is not latched, the pump will start again if the asymmetry is temporary and disappears.
- If the alarm is latched, RESET to check whether the asymmetry was temporary or not. If the asymmetry was temporary the pump will start again.
- In case of permanent phase asymmetry, the fault has to be corrected.

Current transformer (F3)

When AUTOSET is pressed FPC100 checks that the current is within acceptable limits. If the current is below 10mA or above 60mA when AUTOSET is pressed, an F3-alarm is generated and the pump will stop. The measured current is displayed in window 61.

Note: In case of 0 mA (pump is off) when AUTOSET is pressed, the stop level will be set to 0 and no alarm will be generated. This makes it possible to clear the stop level value.

Action:

- See *Choice and adaptation of current transformer* (page 6) for correct choice and adaptation of current transformer(s).

Operation fault (F4)

If snoring is detected at the same time as the high level switch is activated, an-F4 alarm is generated. The alarm relay is activated but the pump doesn't stop. The fault can be generated in two situations:

1. Correct snoring but faulty high level switch indication

   Action:

   - The high level switch can be stuck in the "high level" position. It can also be a short circuit in the high level switch or in the cables between FPC100 and the high level switch. The fault has to be corrected.

2. Correct high level switch indication but faulty snoring

   Action:

   - The stop level is above the normal pumping power. This can be the result if hydraulic parts (e.g. the impeller) are worn out, resulting in lower power consumption than normal. Perform a new AUTOSET or check the hydraulic part of the pump. In either case a new AUTOSET has to be performed.

Fault terminal 5 (F5) e.g. high motortemperature

In case the pump motor is overheated, an F5-alarm is generated and the pump is stopped.

As an alternative the TEMP-input can be used with any device using a voltage-free opening contact such as a motor protection unit.

Terminal 5 supervision is activated when window 31 is set to "on", and the alarm is latched if window 32 is set to "on".

Action:

- If the alarm is not latched, the pump will start again if the fault disappears, e.g. when the pump motor has cooled down.
- If the alarm is latched, RESET when the fault has disappeared or correct the fault in case the fault remains.

Under/Overvoltage (LU/OU)

When FPC 100 is switched on, the voltages on phases L1, L2 and L3 are checked. If a wrong phase voltage is detected, LU (undervoltage) or OU (overvoltage) alarm is generated. The pump will not start.

Under/overvoltage is detected if the phase voltage is outside the voltage range including tolerance (e.g. 3×380-500VAC +/–10%).

Note: Under/overvoltage supervision is only activated at start up when FPC100 is switched on. The purpose with the supervision is to ensure that correct FPC100 (correct voltage range) is used.

If L1 is interrupted when FPC100 is switched on, LU (undervoltage) alarm is generated.

Action:

Check that the rated voltage of FPC100 corresponds with the supplying line voltage. The rated voltage can be found on the rating plate on the side of the control unit.

Check that L1 is not interrupted.

TROUBLESHOOTING

Troubleshooting

Window 00 shows F1-F5, LU or OU

Fault handling according to *PROTECTION AND ALARM* (page 19).

Impossible to do Auto-set

Auto-set is disconnected during the Start-up delay period or if an alarm indication is present.

The pump starts and stops too often or seldom, or the level in the pit is too low or too high

Change the settings in window 21 and window 22 according to *Start conditions and pause time adjustment* (page 14).

The pump stops although it is not snoring

Check the stop level value in window 11. This value is probably too high in relation to measured power in window 04. The pump operating power may have decreased due to worn out hydraulic parts. Perform a new AUTOSET according to *DETAILED SETTINGS* (page 11) or change hydraulic parts if necessary. If hydraulic parts are changed, a new AUTOSET has to be performed.

The pump doesn't stop when snoring

Check the stop level value in window 11. This value is probably too low in relation to measured power in window 04. Perform a new AUTOSET according to *DETAILED SETTINGS* (page 11).

The value in window 04 increases when the pump starts to snore

Check that the current transformer(s) is linked to the phase connected to terminal 9 (L1).

"oor" (out of range) is shown on the display

This means that the value is too big to be shown on the display. The values in windows 06, 07 and 08 can be set to 0 by pressing – and + simultaneously for three seconds.

FPC100 unit is damaged or "dead"

- Component failure in FPC100. FPC100 has to be changed.
- Power supply to FPC100 (L2 or/and L3) is interrupted. Check wiring.

TECHNICAL SPECIFICATIONS

Electronics

Dimension (W×H×D)	45 × 90 × 115 mm (1.77″ × 3.54″ × 4.53″)
Weight	0.3 kg (10.5 oz)
Supply voltage (VAC)	3 × 100-240, 3 × 380-500, 3 × 525-690 Note! UL recognized only up to 600 V
Frequency	45–65 Hz
Current input	Current transformer CT10, 25, 50 or 100 (10/25/50/100 A primary current ⟶ 55 mA secondary current) If current > 100 A CT10 is used with an outer standard transformer
Power consumption	Max 6 VA
Digital input, terminal 3	For a closing contact, internal supply 15–30VDC, short-circuit current 10–20mA
Temperature input, terminal 5	Internal supply 15–30VDC, short-circuit current 2–2.5mA
Pump relay	5 A, 240 VAC Resistive. 1.5 A 240 VAC Pilot duty / AC12
Alarm relay	5 A, 240 VAC Resistive. 1.5 A 240 VAC Pilot duty / AC12
Fuse	Max 10 A
Terminal wire size	Use 75 °C copper (Cu) wire only. 0.2–4 mm2 single core, 0.2–2.5 mm2 flexible core, stripped length 8 mm
Terminal tightening torque	5–7 lbs-in (0.56–0.79 Nm)
Repeatability power measurement	±1 unit in window 04, 24 h, 20°C
Temperature tolerance	< 0.1 % in window 04 / °C
Operating temperature range	–20°C to 50°C (–4°F to 122°F)
Storage temperature range	–30°C to 80°C (–22°F to 176°F)
Protection class	IP20
Compliance	CE and cUL

EU specifications

EMC	EN50081-1, EN50082-2
Electrical safety	IEC 947-5-1:1990 + A1:1994
Rated insulated voltage	690 V
Rated impulse withstand voltage	4000 V
Pollution degree	2

The terminals 3, 4 and 5 are basic insulated from the supply voltage terminals (9, 11 and 13) and the relay terminals (6, 7 and 8).

USA specifications

FCC (Federal Communications Commission)

FPC100 has been tested and found to comply with the limits for a class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. FPC100 generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with this manual, may cause harmful interference, in which case, the user will be required to correct the interference at their own expense.

Canadian specifications

DOC (Department of Communications)

FPC100 does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Canadian interference-Causing Equipment Regulations.

Part numbers

FPC100 including current transformer (CT)

Pump main voltage (50/60Hz)	CT primary rating (A)	Part number
3×100–240V	10	652 02 01
	25	652 02 02
	50	652 02 03
	100	652 02 04
3×380–500V	10	652 02 05
	25	652 02 06
	50	652 02 07
	100	652 02 08
3×525–690V	10	652 02 09
	25	652 02 10
	50	652 02 11
	100	652 02 12

FPC100

3×100–240V	84 03 74
3×380–500V	84 03 75
3×525–690V	84 03 76

Current transformer (CT)

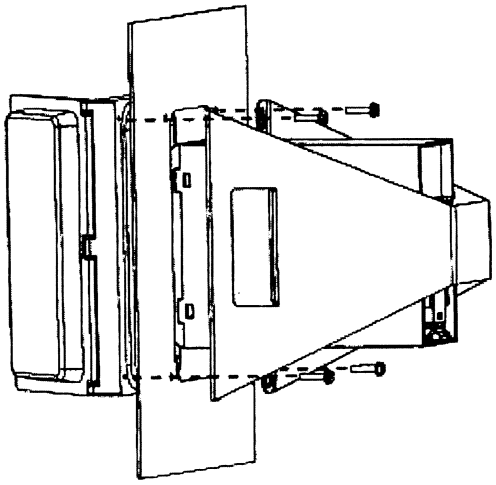
10A	83 95 85
25A	83 95 86
50A	83 95 87
100A	83 95 59

Front panel kit

83 94 12

Contains	Dimension	Parts
Plastic door (IP54)	130×77 mm (5.12″×3.03″)	1 pcs
Mounting plate	128×108 mm (5.04″×4.25″)	1 pcs

Contains	Dimension	Parts
Screws		4 pcs



Xylem |ˈzīləm|

1) The tissue in plants that brings water upward from the roots
2) A leading global water technology company

We're 12,000 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

For more information on how Xylem can help you, go to xyleminc.com

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The original instruction is in English. All non-English instructions are translations of the original instruction.

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893739_4.1_en.GB_2012-01_IOM_FPC100